Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

1. (currently amended) A magnetic resonance imaging apparatus comprising an imaging means for applying high-frequency magnetic fields and gradient magnetic fields to an object in a static magnetic field, in accordance with a pulse sequence for dynamic measurement for continuously obtaining a plurality of time-series images, and for measuring NMR signals emitted from the object, a signal processing means for forming images of a desired tissue of the object, from the NMR signals, a display means for displaying the images and a control means for controlling the imaging means and the signal processing means;

wherein said imaging means is provided with a two-dimensional monitoring mode in which a desired slab of the object is measured using a pulse sequence for the dynamic measurement under a condition of applying gradient magnetic fields with a low spatial resolution, and is provided with a three-dimensional measurement mode in which the same slab is measured using the same pulse sequence under a condition of applying gradient magnetic fields with a high spatial resolution, and

said control means includes mode switching means for switching from the two-dimensional monitoring mode to the three-dimensional measurement mode, and

said switching means switches the two-dimensional monitoring mode to the three-dimensional measurement mode with desired timing when the two-dimensional monitoring mode is performed, and

wherein the dynamic measurement performed by said imaging means is blood imaging

for observing a change of blood flow using a contrast agent, where ||the|| slice encode is omitted in the two-dimensional monitoring mode to obtain two-dimensional images and the slice encode is added in the three-dimensional measurement mode to obtain three-dimensional images,

wherein said control means controls said signal processing means to reconstruct images immediately after the three-dimensional measurement mode begins, using data including data acquired in the pulse sequence performed without the slice encode just before the three-dimensional measurement.

2. (original) The magnetic resonance imaging apparatus of claim 1,

wherein the apparatus is provided with means for extracting reference data from the dynamic measurement data acquired in the monitoring mode, and a temporal change of the extracted reference data is displayed on said displaying means.

3. (currently amended) The magnetic resonance imaging apparatus of claim 2,

wherein the desired timing for switching by said mode switching means ~~switches~~ from the two-dimensional monitoring mode to the three-dimensional measurement mode includes a timing when the extracted reference data ~~or the change of the reference data~~ reaches a predetermined threshold value.

4. (currently amended) The magnetic resonance imaging apparatus of claim 2 or claim 3,

wherein the reference data is~~, among the NMR signals acquired in the monitoring mode,~~

a signal valuc ~~of the~~ at an origin of [[the]] a k-space among the NMR signals acquired in the monitoring mode or an integration of data in [[the]] a frequency encoding direction including the origin of the k-space.

5. (currently amended) The magnetic resonance imaging apparatus of claim 2 or claim 3,

wherein the referencc data is, ~~among the NMR signals acquired in the monitoring mode,~~ a difference of a signal value ~~of the~~ at an origin of [[thc]] a k-space among the NMR signals acquired in the monitoring modc or an integration of data in [[the]] a frequency encoding direction including the origin of the k-spacc from the corresponding value acquired at the beginning of the monitoring mode.

Claim 6 (canceled).

7. (currently amended) The magnetic resonance imaging apparatus of claim 1,

wherein data of the time-series images is thrcc-dimensional data and is transformed to a two-dimcnsional projected image to be displayed on said display means.

8. (previously presented) The magnetic resonance imaging apparatus of claim 1,

wherein said mode switching means has an input means for mode switching, and the two-dimensional monitoring modc is switched to the three-dimensional measurement modc by directly inputting a switching instruction to said modc switching means.

9. (currently amended) A magnetic resonance imaging apparatus comprising an imaging means for applying high-frequency magnetic fields and gradient magnetic fields to an object in a static magnetic field in accordance with a pulse sequence for dynamic measurement for continuously obtaining a plurality of time-series images, and for measuring NMR signals emitted from the object, signal processing means for forming images of a desired tissue of the object from the NMR signals, a display means for displaying the images and a control means for controlling the imaging means and the signal processing means,

wherein said imaging means is provided with a two-dimensional monitoring mode in which a desired slab of the object is measured using a pulse sequence for the dynamic measurement under a condition of applying gradient magnetic fields with a low spatial resolution and a three-dimensional measurement mode in which the same slab is measured using the same pulse sequence under a condition of applying gradient magnetic fields with a high spatial resolution,

said control means has a mode switching means for switching from the two-dimensional monitoring mode to the three-dimensional measurement mode, and

said switching means switches the two-dimensional monitoring mode to the three-dimensional measurement mode with desired timing ~~during~~ when the two-dimensional monitoring mode is performed, and

the gradient magnetic fields include a slice encode, a phase encode and a frequency encode for the two-dimensional or three dimensional measurement, and under the condition of applying gradient magnetic fields with low spatial resolution in the two-dimensional monitoring mode one of the slice encode and the phase encode is omitted and under the condition of applying gradient magnetic fields with high spatial resolution in the three-dimensional

measurement mode both of the slice encode and the phase encode is imparted,

wherein said control means controls said signal processing means to reconstruct images immediately after the three-dimensional measurement mode begins, using data including data acquired in the pulse sequence performed without the slice encode or the phase encode just before the three-dimensional measurement.

Claim 10 (canceled).

11. (currently amended) The magnetic resonance imaging apparatus of claim 9,

wherein a difference image between [[the]] blood images acquired before and after injection of [[the]] a contrast agent is displayed on said displaying means.

12. (currently amended) The magnetic resonance imaging apparatus of claim 2, wherein the desired timing for switching by said mode switching means ~~switches~~ from the two-dimensional monitoring mode to the three-dimensional measurement mode includes a timing when ~~the extracted reference data or~~ the change of the reference data exceeds a predetermined threshold value.

13. (previously presented) The magnetic resonance imaging apparatus of claim 2, wherein said mode switching means finishes the three-dimensional measurement mode when the extracted reference data or the change of the reference data reaches a predetermined threshold value.

14. (previously presented) The magnetic resonance imaging apparatus of claim 1, wherein the control means sends an instruction to the mode switching means to indicate starting time of the three-dimensional measurement mode based on signal intensity of data acquired when the pulse sequence is applied without slice encode.